Produce Warehouse Management System

Project Overview

The Produce Warehouse Management System is a Flask-based web application designed to manage the operations of a direct-to-consumer (D2C) produce warehouse. This system includes features to handle the reception, storage, management, and traceability of produce, ensuring compliance with supply chain traceability and bio-degradable packaging standards. The application is structured to support multiple temperature zones and predict the shelf life of produce items.

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1. Project Structure

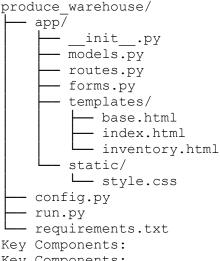
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arduino arduino

produce warehouse/

produce_warehouse/



Key Components:

app/: Contains the core application code, including initialization, models, routes, forms, templates, and static files.

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config.py: Holds configuration settings, such as database connections and secret keys.

run.py: The main entry point for running the application. requirements.txt: Lists the dependencies required to run the application.

- 2. Core Functionality
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- 2.1 Receiving Produce

The application allows the warehouse to receive produce shipments. The received produce is stored in a database with details such as name, source, quantity, storage zone, packaging type, and shelf life.

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API Endpoint: API Endpoint:

Route: /api/receive
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Method: POST

Input: JSON data with produce details.

Response: Confirms successful receipt and logs the transaction.

2.2 Inventory Management

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The system provides an overview of the current inventory, listing all produce stored in the warehouse.

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API Endpoint:

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Route: /inventory Route: /inventory Method: GET

Output: Renders an HTML page with inventory details, including produce name, source, quantity, storage zone, and shelf life.

2.3 Storage Zone Management

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The storage zone for each produce item can be updated to reflect changes in warehouse organization.

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API Endpoint:

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Route: /api/storage/produce_id>
Route: /api/storage/cproduce_id>

Method: PUT

Input: JSON data with the new storage zone.

Response: Confirms successful update and logs the change.

2.4 Traceability Logs

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The system keeps track of every action taken on the produce, ensuring full traceability.

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API Endpoint:

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Route: /api/traceability/cproduce_id>
Route: /api/traceability/cproduce_id>

Method: GET

Output: JSON data with the produce's traceability log, including timestamps and actions.

2.5 Shelf-Life Prediction

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The application predicts the remaining shelf life of produce items based on their received date and shelf-life duration.

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API Endpoint:

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Route: /api/shelf-life/produce id>

Route: /api/shelf-life/produce id>

Method: GET

Output: JSON data indicating the remaining shelf life and expiration status.

- 3. Technical Details
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- 3.1 Flask Framework

The application is built using Flask, a lightweight and versatile Python web framework that facilitates rapid development and scalability. Flask's modular design allows for the separation of concerns through blueprints, making the application easy to extend.

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3.2 Database Management

The application uses SQL Alchemy for Object-Relational Mapping (ORM) and SQLite as the database. This setup allows for easy database operations management, including migrations and schema management through Flask-Migrate.

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Database Models:

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Produce: Represents produce items, including details like name, source, quantity, and shelf life.

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Traceability Log: Logs every action taken on a produced item, ensuring full traceability.

- 3.3 Frontend Components
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The front end is built using HTML, CSS, and Bootstrap for a responsive design. Flask's templating engine, Jinja2, dynamically generates HTML pages based on server-side data.

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Templates:

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base.html: The base template for the application, providing a consistent layout.

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index.html: The homepage introduces the system's capabilities.

inventory.html: Displays the current inventory with all produce items listed.

Static Files:

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style.css: Contains custom CSS to style the application, ensuring a clean and modern user interface.

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